

Dr. Shyama Prasad Mukherjee University

University Department of Physics

Model question

Electronics Sem-III

Paper-SEC-01

GROUP-A(MCQ)

Answer 50 questions each question contains 2 marks

1) Which among the below mentioned packages does not belong to the category of 'Small Outline Package'?

- a. SO
- b. SOP
- c. SOT
- d. SON

ANSWER: SON

2) Which type of solderability testing is carried out for the generation of solder sample due to immersion of wire or sheet metal specimen in a bath of molten solder?

- a. Solder Bath Testing
- b. Meniscus Rise Testing
- c. Solder Iron Testing
- d. None of the above

ANSWER: Meniscus Rise Testing

3) Which among the below stated soldering methods is also renowned as 'High Frequency Resistance Soldering'?

- a. Iron Soldering
- b. Furnace Soldering
- c. Torch Soldering
- d. Electrical Soldering

4) Which among the below mentioned approaches belongs to the category of In-circuit Testing?

- a. Impedance Testing
- b. Component Testing

- c. Apply Signal and check output
- d. All of the above

ANSWER: All of the above

5) High current circuits are purposely located or placed near the edge of PCB in accordance to the supply lines for _____

- a. Removal of heat
- b. Isolation of stray current
- c. Reduction of path length
- d. All of the above

ANSWER: Removal of heat

6) What is/are the necessity/ies to provide guarding to precision differential amplifiers?

- a. To increase leakage resistance
- b. To reduce capacitance between signal conductors & ground
- c. Both a and b
- d. None of the above

7) Which phenomenon is not reduced by the circuit paths of lowest impedances especially provided by power and return planes for shielding purposes?

- a. Radiation
- b. Convection
- c. Noise
- d. Crosstalk

ANSWER: Convection

8) Which among the below specified assertions is not a grounding consideration associated with ADC as well as DAC?

- a. Analog side to analog ground
- b. Digital side to digital ground
- c. Use of separate power supply and connection of their ground leads to single point reference
- d. Reduction of inductive loop area between power and return traces

ANSWER: Reduction of inductive loop area between power and return traces

9) Which among the below stated devices/equipments are preferred for elimination of ground and supply line noise especially in TTL/CMOS / ECL PCB designing?

- a. Coupling capacitor
- b. Decoupling capacitor

- c. Snubber circuits
- d. All of the above

ANSWER: Decoupling capacitor

10) Which among the below mentioned assertions is not a way of cross-talk reduction while designing digital PCBs?

- a. Decrease in the distance between conductors
- b. Shielding of clock lines with guard strips
- c. Reduction in the loop area of circuits
- d. Avoid running of parallel traces for longer distances especially for asynchronous signals

ANSWER: Decrease in the distance between conductors

11) Which among the below specified condition is precise in the crosstalk verification mechanism using logic flow in opposite direction with the limit of avoiding dangerous interference in digital PCB designing?

- a. $Z_{\text{even}} > Z_{\text{odd}}$
- b. $Z_{\text{odd}} \geq 0.5 Z_{\text{even}}$
- c. $Z_{\text{odd}} \geq 0.8 Z_{\text{even}}$
- d. $Z_{\text{odd}} = Z_{\text{even}}$

ANSWER: $Z_{\text{odd}} \geq 0.8 Z_{\text{even}}$

12) Which among the following assists in obtaining the desired value of wave impedance in reflection phase while designing digital PCBs?

- A. Width of signal lines
- B. Distance between signal line and ground line
- C. Signal Delays
- D. Double Pulsing

- a. A & B
- b. B & C
- c. C & D
- d. A, B, C, D

ANSWER: A & B

13) Which problems are about to occur if PCB is not designed properly in a confined manner for digital circuits?

- A. Diffraction
- B. Refraction
- C. Ground & Supply-line Noise
- D. Electromagnetic Interference

- a. A & B
- b. B & C
- c. C & D
- d. A, B, C, D

ANSWER: C & D

14) What effects can be observed if the separate power and ground planes are provided with large conducting surfaces for better decoupling in PCB layouts?

- a. Increase in self-inductance
- b. Reduction in self-inductance
- c. Stability in self-inductance
- d. None of the above

ANSWER: Reduction in self-inductance

15) What should be the resistance of 0.6 mm wide conductor with 15 cm length and 25 μm thickness of standard copper foil? (Assume $\rho = 1.7241 \times 10^{-6}$ (at 20° C))

- a. 118.2 m Ω
- b. 138.2 m Ω
- c. 172.4 m Ω
- d. 192.4 m Ω

ANSWER: 172.4 m Ω

16) Which type of PCB requires minimum soldering on component side in order to avoid replacement oriented difficulties?

- a. Single-sided PCB
- b. Double-sided PCB
- c. Both a and b
- d. None of the above

ANSWER: Double-sided PCB

17) Which factors contribute to the occurrence of mechanical stress?

- a. Resonance
- b. Cracked Solder Joints
- c. Both a and b
- d. None of the above

ANSWER: Both a and b

18) The actual cost of PCB can be evaluated on the basis of _____

- a. PCB size & material
- b. Number of layers
- c. Vias on PCB
- d. All of the above

ANSWER: All of the above

19) Which terminology of PCB represents a thin photo-sensitive polymer by supporting photographic pattern of single traces or IC pads for etching?

- a. Prepreg
- b. Etching
- c. Photo-resist
- d. Solder mask

ANSWER: Photo-resist

20. PCBs should be fabricated with _____ layers.

- a. Odd Number of
- b. Even Number of
- c. Any Number of

21. Which of the following is not taken into consideration when calculating the characteristic impedance for each layer?

- a. Trace width
- b. Trace height
- c. Trace length
- d. Distance of the trace to a plane

22. The declaration of Vias-In-Pads is determined in the

- a. Assembly Notes
- b. Fabrication Notes
- c. Fabrication Files
- d. Via stack up
- e. Layer Stack up

23. Select the answer that is true: Mechanical layers

- a. are unique to each project
- b. are only declared in the PCB editor during layout
- c. follow an IPC standard
- d. should be used in the footprint libraries for courtyards and assembly files

24. Silk Screens

- a. Are not required for every component
- b. Are highly recommended for prototype boards
- c. Are not necessary for production boards
- d. All of the above

25. The use of 3D component models in the PCB layout can assist with

- a. Electrical clearance
- b. Component clearance
- c. All of the above
- d. None of the above

26. True or False – The solder mask has an impact on the trace impedance.

- a. True
- b. False

27. When writing a requirement, the following word should be used to denote a requirement:

- a. Should
- b. Would
- c. Can
- d. Shall
- e. May

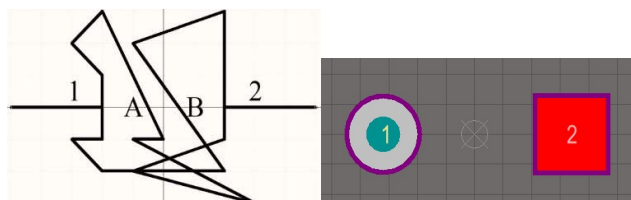
28. When writing a requirement

- a. The use of the word “and” is okay
- b. The use of the word “or” is okay
- c. Both of the above
- d. None of the above

29. A well written requirement

- a. has a complex sentence structure
- b. uses technical verbiage
- c. is testable by its nature
- d. needs to be vague

30. Consider the following symbol and corresponding footprint:



The following symbol and corresponding footprint:

- a. Recognized by the EDA tool as a valid component
 - b. Would be flagged by the Electrical Rule checker in the schematic tool
 - c. Would be flagged by the Design Rule checker in the PCB editor
 - d. Both B and C
31. When is the earliest time one should communicate the bill of materials:
- a. After fabrication has been started
 - b. After the boards have been fabricated
 - c. When the schematics are completed
 - d. After the layout is complete
32. What is the best method to provide a unique number for each component in the library?
- a. Use the manufacturer's part number
 - b. Use the vendor's part number
 - c. Use a part number that is assign by the company you work for
 - d. Use a part number that you make up as you go
33. During post assembly testing, it was found that a latch on one of the connectors cannot be fully extended due to other components located nearby. What would have prevented this situation from occurring?
- a. The use of a 3D component
 - b. The use of a 3D component and component clearance rule
 - c. The use of a courtyard
 - d. The use of a courtyard and a component clearance rule
34. Though schematic tools do have to use a grid for pin connectivity, in theory, the grid used in a schematic is
- a. In metric (mm)
 - b. In imperial (mils)
 - c. Both A and B interchangeably
 - d. Dimensionless
35. The grid used in a PCB layout tool should be
- a. In metric (mm)
 - b. In imperial (mils)
 - c. Both A and B interchangeably
 - d. Either A or B
36. The biggest factor when it comes to impedance is
- a. Clock speed of the board crystal
 - b. The integrity of the signal from the output buffer of the sending component
 - c. The voltage level
 - d. The physical aspects of the board
37. True or False: Microvias are the same as 1 layer blind or buried vias
- a. True
 - b. False

38. Which of the following drill document(s) must be provided to the fabricator to program their drilling equipment?

- a. Drill Plot
- b. Drill Drawing
- c. NC Drill file
- d. All of the above

39. True or False: ODB++ and Gerbers are proprietary formats

- a. True
- b. False

40. The solder paste files are generally produced

- a. In the assembly file
- b. In the fabrication files
- c. Manually drawn
- d. As part of the bill of materials

41. PCB stands for,

- a) Printing Circuit Board
- b) Printout Circuit Board
- c) Printed Circuit Board**
- d) None of these above

Ans: - c

42. What is the ratio of tin & lead in soldering metal alloy?

- a) 50% & 50%
- b) 20% & 80%
- c) 10% & 90%
- d) 60% & 40%**

Ans: - d

43. Resistibility has a relation with

- a) Length of the material**
- b) Width of the Material
- c) Cross section area of the material**
- d) All of them

Ans: - a, c

44. Color code for 1 ohm resistance is –

- a) Black, Brown, Gold

b) **Brown, Black Gold**

c) Both of them

d) None of them

Ans: -b

45. If a circuit uses 1200 volts at 800mA, what is the input power?

a) 1000 watts

b) 554 watts

c) 300 watts

d) **960watts**

Ans: - d

46. The three basic meters-voltmeter, ammeter and ohmmeter combined into a case are known as a:

a) Kilometer

b) **Multimeter**

c) Wavemeter

d) Wattmeter

Ans: - b

47. The unit of electrical charge is –

a) **Coulomb**

b) Newton

c) Ampere

d) Volt

Ans: - a

48. The Ohm is the unit of measure of:

a) **Resistance**

b) Electromotive force

c) Current

d) Magnetomotive force

Ans: - a

49. What is the unit of Capacitance?

- a) Ohm
- b) Henry
- c) Maxwell
- d) Farad**

Ans: - d

50. The unit of conductance is –

- a) Ohm
- b) Ampere
- c) Mho**
- d) Voh

Ans: - c

51. The three basic particles which make up all atoms are the:

- a) Coulomb, ampere and electron
- b) Electron, proton and nucleus
- c) Quark, neutron and proton
- d) Electron, proton and neutron**

Ans: - d

52. No. of electrons in Helium atom

- a) 3
- b) 2**
- c) 1
- d) None of the above

Ans: - b

53. Coulomb's law states:

- a) Unlike Charges attract and like charges repel.**
- b) Like charges attract and unlike charges repel.

Ans: - a

54. Material which have a large number of free electrons are called as:

- a) Inductors
- b) Insulators
- c) Semiconductor
- d) Conductors**

Ans: - d

55. Bend the leads of components at _____ degree angle with PCB.

- a) 40
- b) 50
- c) 35
- d) 45**

Ans: - d

56. If colour code is Red, Brown, Red, Silver then value of R is,

- a) 21 K ohm, 5%
- b) 22 ohm, 5%
- c) 2100 ohm, 10%**
- d) 2.2 K ohm, 10%

Ans: - c

57. A potentiometer is a:

- a) Variable power supply
- b) Variable resistor**
- c) Variable capacitor
- d) Meter for measuring potential difference

Ans: - b

58. The Ability of a device or circuit to oppose any change in current flow is:

- a) Capacitance**
- b) Resistance

- c) Inductance
- d) Conductance

Ans: -a

59. The opposition to the movement of electrons is:

- a) **Resistance**
- b) Voltage
- c) Current
- d) Magnetism

Ans: - a

60. The device which is used to measure current?

- a) Coulomb meter
- b) **Ammeter**
- c) Voltmeter
- d) Ohmmeter

Ans: - b

61. The device which is used to measure Voltage?

- a) Ammeter
- b) Ohmmeter
- c) **Voltmeter**
- d) Potentiometer

Ans: - c

62. The device which is used to measure resistance?

- a) Voltmeter
- b) Ammeter
- c) Wavemeter
- d) **Ohmmeter**

Ans: - d

63. The nucleus of an atom is located at the center and is composed of:

- a) Electron and Protons
- b) Protons and Neutrons**
- c) Coulombs and Neutrons
- d) Electrons and Neutrons

Ans: - b

64. What measurements can you make using a oscilloscope?

- a) Current, Voltage and resistance
- b) Voltage, period and frequency**
- c) Time, frequency and resistance
- d) Power, distance and frequency

Ans: - b

65. The temperature range for soldering process is.....

- A.40°C to 100°C
- B.180°C to 250°C
- C.300°C to 500°C
- D.600°C to 900°C
- E.1000°C to 2000°C
- B. 180⁰ Cto 250⁰C

66. A soldering iron 'bit' is made of.....

- A.Brass
- B.Tin
- C.Steel
- D.Copper
- D.Copper

67. Heat for soldering process is supplied by.....

- A.Soldering iron
- B.Induction furnace
- C.Electric resistance method
- D.Any of the above

D.Any of the above

68. Soldering iron is made of wedge shape in order to.....

- A. Apply high pressure at edge
- B. Retain heat
- C. Retain solder
- D. Forge welding
- E. Arc welding

B. Retain heat

69. The purpose of using flux in soldering is to.....

- A. Increase fluidity of solder metal
- B. Fill up gaps left in a bad joint
- C. Carbon steel
- D. Prevent oxides forming
- E. Wash away surplus solder

C. Prevent oxides forming

70. Brazing is the process of.....

- A. Joining plastic sheets
 - B. Hard soldering using brass spelter
 - C. Casing in brass
 - D. Making steel look like brass
 - E. Any of the above
- B. Hard soldering using brass spelter

71. The commonly used flux for brazing is.....

- A. Resin
 - B. NH_4Cl
 - C. Borax
 - D. Soft iron
- C. Borax

72. The temperature range of brazing process is.....

- A. 150°C to 250°C
 - B. 250°C to 450°C
 - C. 500°C to 700°C
 - D. 700°C to 900°C
 - E. 1000°C to 2000°C
- D. 700°C to 900°C

73. The purpose of using borax in brazing is to.....

- A. Replace flux
- B. Dissolve oxides when heating the work
- C. Accelerate the formation of oxides on the work

- D.Prevent the spelter from melting too quickly
 - E.Increase the fluidity of brazing process
 - B.Dissolve oxides when heating the work
74. The flux in brazing process is used in the form of.....

- A.Powder
- B.Liquid
- C.Paste
- D.Any of the above
- E.None of the above

- D.Any of the above
75. Entrapped fluxes, during brazing result in.....

- A.Presence of gas pockets
- B.Corrosion
- C.Cracking
- D.Distortion of joints
- E.Erosion

- B.Corrosion
76. Which of the following flux is used for brazing aluminium and magnesium.....

- A.Mixture of boric acid,borax and wetting agent
- B.Boric acid,borax or fluoride with a wetting agent
- C.Chlorides and fluorides mixed with water
- D.Any of the above

- C.Chlorides and fluorides mixed with water
77. When brazing is carried out.....

- A.A joint is made between two parts by molten spelter
- B.The edges of the joint melt and run together
- C.Spelter forms an alloy with the flux
- D.Flux prevents the work from melting
- E.Flux acts as a cementing material

- A.A joint is made between two parts by molten spelter
78. Spelter is same as.....

- A.Tin
- B.Zinc
- C.Lead
- D.Silver
- E.Brass

- B.Zinc
79. A braze joint may be satisfactorily used on components made of.....

- A. Tinplate
- B. Brass
- C. Copper
- D. Aluminium
- E. None of the above

C. Copper

80. In sand moulding, the middle part of flask is called.....

- A. Cope
- B. Cheek
- C. Drag
- D. Flask-middle
- E. Any of the above

B. Cheek

81. In sand moulding the bottom most part of the flask is called.....

- A. Cope
- B. Cheek
- C. Drag
- D. Flask bottom

C. Drag

82. In which type of moulding, cow dung is sometimes is used.....

- A. Bench moulding
- B. Dry sand moulding
- C. Green sand moulding
- D. All of the above
- E. None of the above

C. Green sand moulding

83. The main advantage of shell moulding is that.....

- A. A metallic pattern is used
- B. The moulds are stronger
- C. Thin section can be easily obtained
- D. Highly complex sections can be easily obtained
- E. High production rate is possible

C. Thin section can be easily obtained

84. Following moulding machine is used to get uniform sand hardness.....

- A. Jolt
- B. Sand slinger
- C. Squeezing
- D. Diaphragm moulding

- E. None of the above
- D. Diaphragm moulding
- 85.** Sands are graded according to their.....

- A. Source of origin
- B. Strength
- C. Permiability
- D. Clay content and grain size
- E. Any of the above
- D. Clay content and grain size